CLAIMS

What is claimed is:

1.   In a first one of a plurality of Home Agents supporting Mobile IP, a method of

processing a registration request from a Mobile Node that has roamed to a Foreign

Agent supporting Mobile IP, comprising:

receiving a registration request addressed to a virtual Home Agent address

associated with the plurality of Home Agents;

sending the registration request to a second one of the plurality of Home

Agents such that the second one of the plurality of Home Agents creates a binding

between the Mobile Node and the Foreign Agent;

creating a temporary binding between the Mobile Node and the Foreign

Agent;

receiving a registration reply from the second one of the plurality of Home

Agents;

updating the temporary binding to create a permanent binding when the

registration reply is received from the second one of the plurality of Home Agents;

and

sending the registration reply to the Foreign Agent identified in the temporary

binding.

2.   The method as recited in claim 1, wherein the temporary binding comprises an

identifier associated with the Mobile Node, an IP address associated with the Foreign

Agent, and an IP address associated with the second one of the plurality of Home Agents.

3.   The method as recited in claim 1, wherein the permanent binding comprises an identifier associated with the Mobile Node, an IP address associated with the Foreign Agent, an IP address associated with the second one of the plurality of Home Agents, and a registration lifetime.

4.   The method as recited in claim 3, wherein the identifier is an IP address.

5.   The method as recited in claim 4, wherein the permanent binding further comprises an NAI associated with the Mobile Node.

6.   The method as recited in claim 3, further comprising:

obtaining the registration lifetime from the registration reply received from the second one of the plurality of Home Agents.

7.   The method as recited in claim 1, wherein updating the temporary binding to create a permanent binding comprises:

specifying a granted registration lifetime obtained from the registration reply received from the second one of the plurality of Home Agents.

8.   The method as recited in claim 7, wherein updating the temporary binding to create a permanent binding comprises:

specifying an IP address assigned to the Mobile Node by the second one of the plurality of Home Agents.

9.　The method as recited in claim 1, further comprising:

obtaining the temporary binding; and

identifying the Foreign Agent from the temporary binding prior to sending the registration reply to the Foreign Agent.

10.　The method as recited in claim 1, wherein the registration request specifies a destination MAC address equal to a MAC address assigned to the second one of the plurality of Home Agents.

11.　The method as recited in claim 1, wherein the registration reply specifies a destination MAC address equal to a MAC address assigned to the first one of the plurality of Home Agents.

12.　The method as recited in claim 1, wherein the registration request specifies a destination IP address as the virtual Home Agent address.

13.　The method as recited in claim 1, wherein the registration reply specifies a destination IP address as the virtual Home Agent address.

14.　The method as recited in claim 1, wherein the registration request specifies a destination IP address as the virtual Home Agent address and the registration reply

specifies a destination IP address as the virtual Home Agent address.

15.   The method as recited in claim 1, further comprising:

advertising a virtual network associated with the virtual Home Agent address.

16.   The method as recited in claim 15, wherein advertising comprises sending a routing table update.

17.   The method as recited in claim 1, further comprising:

sending at least one of Home Agent health and load information associated with the first one of the plurality of Home Agents to one or more of the plurality of Home Agents.

18.   The method as recited in claim 15, further comprising:

receiving an advertisement from one of the plurality of Home Agents, the advertisement advertising the virtual network associated with the virtual Home Agent address.

19.   The method as recited in claim 18, wherein receiving an advertisement from one of the plurality of Home Agents comprises:

receiving one or more routing table updates advertising the virtual network associated with the virtual Home Agent address.

20.   The method as recited in claim 18, further comprising:

receiving at least one of Home Agent health and load information associated

with the one of the plurality of Home Agents.

21.   The method as recited in claim 1, further comprising:

receiving at least one of Home Agent health and load information associated

with one of the plurality of Home Agents.

22.   The method as recited in claim 21, further comprising:

determining from the Home Agent health information whether the one of the

plurality of Home Agents is functioning; and

when the one of the plurality of Home Agents is not functioning, sending a set

of Mobile Node bindings to a backup Home Agent associated with the virtual Home

Agent address and updating one or more bindings such that the one or more bindings

are associated with the backup Home Agent.

23.   The method as recited in claim 22, wherein updating one or more bindings

such that the one or more bindings are associated with the backup Home Agent

comprises:

associating one or more Mobile Nodes with an IP address of the backup Home

Agent.

24. The method as recited in claim 22, further comprising:

selecting the backup Home Agent from a plurality of backup Home Agents.

25. The method as recited in claim 24, further comprising:

examining load information of the plurality of backup Home Agents prior to selecting the backup Home Agent.

26. The method as recited in claim 1, further comprising:

sending one or more bindings to one or more backup Home Agents, the one or more bindings being associated with one or more of the plurality of Home Agents.

27. The method as recited in claim 26, wherein sending one or more bindings comprises:

sending one or more temporary bindings and one or more permanent bindings to the one or more backup Home Agents.

28. The method as recited in claim 1, further comprising:

when the registration request is received, searching for a binding for the Mobile Node;

when a binding for the Mobile Node exists, identifying the second one of the plurality of Home Agents in the binding prior to sending the registration request to the second one of the plurality of Home Agents; and

when a binding for the Mobile Node does not exist, selecting the second one

of the plurality of Home Agents prior to sending the registration request to the second

one of the plurality of Home Agents.

29. In a Home Agent supporting Mobile IP, a method of processing a registration

request from a Mobile Node that has roamed to a Foreign Agent supporting Mobile

IP, comprising:

receiving a registration request from a primary one of a plurality of Home

Agents, the registration request being addressed to a virtual Home Agent address

associated with the plurality of Home Agents, the Home Agent being one of the

plurality of Home Agents configured with the virtual Home Agent address;

processing the registration request such that a binding between the Mobile

Node and the Foreign Agent is created; and

sending a registration reply to the primary one of the plurality of Home

Agents.

30. The method as recited in claim 29, wherein the registration request specifies a

destination MAC address equal to a MAC address assigned to the Home Agent.

31. The method as recited in claim 29, wherein the registration reply specifies a

destination MAC address equal to a MAC address assigned to the primary one of the

plurality of Home Agents.

32.   The method as recited in claim 29, wherein the registration request specifies a destination IP address as the virtual Home Agent address.

33.   The method as recited in claim 29, wherein the registration reply specifies a destination IP address as the virtual Home Agent address.

34.   The method as recited in claim 29, wherein the registration request specifies a destination IP address as the virtual Home Agent address and the registration reply specifies a destination IP address as the virtual Home Agent address.

35.   The method as recited in claim 29, further comprising:

sending an agent advertisement, the agent advertisement advertising a virtual network associated with the virtual Home Agent address

36.   The method as recited in claim 35, wherein the agent advertisement further comprises at least one of Home Agent health and load information.

37.   The method as recited in claim 35, further comprising:

receiving an advertisement from one of the plurality of Home Agents, the advertisement advertising the virtual network associated with the virtual Home Agent address.

38.   The method as recited in claim 37, wherein receiving an advertisement comprises:

receiving one or more routing table updates advertising the virtual network.

39.   The method as recited in claim 37, further comprising:

receiving at least one of Home Agent health and load information from the one of the plurality of Home Agents.

40.   The method as recited in claim 29, further comprising:

receiving Home Agent health and load information associated with one of the plurality of Home Agents.

41.   The method as recited in claim 29, further comprising:

receiving Home Agent health and load information associated with the primary one of the plurality of Home Agents.

42.   The method as recited in claim 29, further comprising:

sending Home Agent health and load information associated with the Home Agent to one or more of the plurality of Home Agents.

43.   In a Mobile Node supporting Mobile IP, a method of registering with a Home Agent, comprising:

configuring the Mobile Node with a virtual Home Agent address, the virtual

Home Agent address being associated with a plurality of Home Agents;

configuring the Mobile Node as residing on a virtual network associated with the virtual Home Agent address;

sending a registration request via a Foreign Agent to which the Mobile Node has roamed, the registration request specifying the virtual Home Agent address; and

receiving a registration reply in response to the registration request.

44. A first one of a plurality of Home Agents supporting Mobile IP, the first one of the plurality of Home Agents being adapted for processing a registration request from a Mobile Node that has roamed to a Foreign Agent supporting Mobile IP, comprising:

means for receiving a registration request addressed to a virtual Home Agent address associated with the plurality of Home Agents;

means for sending the registration request to a second one of the plurality of Home Agents such that the second one of the plurality of Home Agents creates a binding between the Mobile Node and the Foreign Agent;

means for creating a temporary binding between the Mobile Node and the Foreign Agent;

means for receiving a registration reply from the second one of the plurality of Home Agents;

means for updating the temporary binding to create a permanent binding when the registration reply is received from the second one of the plurality of Home Agents; and

means for sending the registration reply to the Foreign Agent identified in the

temporary binding.

45.   A first one of a plurality of Home Agents supporting Mobile IP, the first one

of the plurality of Home Agents being adapted for processing a registration request

from a Mobile Node that has roamed to a Foreign Agent supporting Mobile IP,

comprising:

a processor; and

a memory, at least one of the processor and the memory being adapted for:

receiving a registration request addressed to a virtual Home Agent address

associated with the plurality of Home Agents;

sending the registration request to a second one of the plurality of Home

Agents such that the second one of the plurality of Home Agents creates a binding

between the Mobile Node and the Foreign Agent;

creating a temporary binding between the Mobile Node and the Foreign

Agent;

receiving a registration reply from the second one of the plurality of Home

Agents;

updating the temporary binding to create a permanent binding when the

registration reply is received from the second one of the plurality of Home Agents;

and

sending the registration reply to the Foreign Agent identified in the temporary

binding.

46.   A computer-readable medium storing thereon computer-readable instructions for processing a registration request from a Mobile Node that has roamed to a Foreign Agent supporting Mobile IP in a first one of a plurality of Home Agents supporting Mobile IP, comprising:

instructions for receiving a registration request addressed to a virtual Home Agent address associated with the plurality of Home Agents;

instructions for sending the registration request to a second one of the plurality of Home Agents such that the second one of the plurality of Home Agents creates a binding between the Mobile Node and the Foreign Agent;

instructions for creating a temporary binding between the Mobile Node and the Foreign Agent;

instructions for receiving a registration reply from the second one of the plurality of Home Agents;

instructions for updating the temporary binding to create a permanent binding when the registration reply is received from the second one of the plurality of Home Agents; and

instructions for sending the registration reply to the Foreign Agent identified in the temporary binding.

47.   A Home Agent supporting Mobile IP, the Home Agent being adapted for processing a registration request from a Mobile Node that has roamed to a Foreign Agent supporting Mobile IP, comprising:

means for receiving a registration request from a primary one of a plurality of Home Agents, the registration request being addressed to a virtual Home Agent address associated with the plurality of Home Agents, the Home Agent being one of the plurality of Home Agents configured with the virtual Home Agent address;

means for processing the registration request such that a binding between the Mobile Node and the Foreign Agent is created; and

means for sending a registration reply to the primary one of the plurality of Home Agents.

48.   A Home Agent supporting Mobile IP and adapted for processing a registration request from a Mobile Node that has roamed to a Foreign Agent supporting Mobile IP, comprising:

a processor; and

a memory, at least one of the processor and the memory being adapted for:

receiving a registration request from a primary one of a plurality of Home Agents, the registration request being addressed to a virtual Home Agent address associated with the plurality of Home Agents, the Home Agent being one of the plurality of Home Agents configured with the virtual Home Agent address;

processing the registration request such that a binding between the Mobile Node and the Foreign Agent is created; and

sending a registration reply to the primary one of the plurality of Home

Agents.

49.   A computer-readable medium storing thereon computer-readable instructions

for processing a registration request from a Mobile Node that has roamed to a Foreign

Agent supporting Mobile IP in a Home Agent supporting Mobile IP, comprising:

instructions for receiving a registration request from a primary one of a

plurality of Home Agents, the registration request being addressed to a virtual Home

Agent address associated with the plurality of Home Agents, the Home Agent being

one of the plurality of Home Agents configured with the virtual Home Agent address;

instructions for processing the registration request such that a binding between

the Mobile Node and the Foreign Agent is created; and

instructions for sending a registration reply to the primary one of the plurality

of Home Agents.